

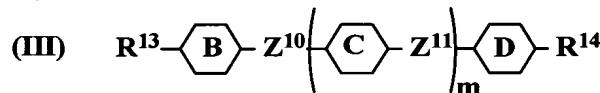
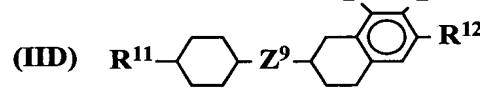
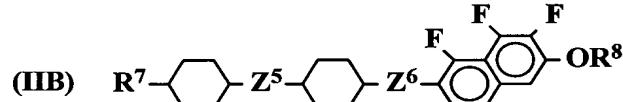
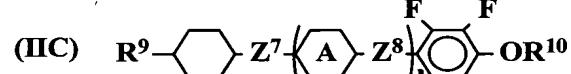
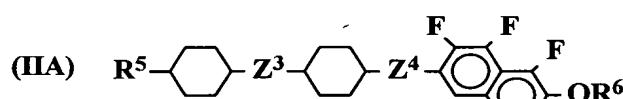
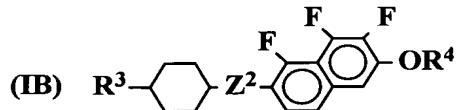
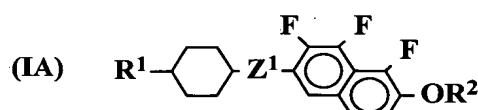
Amendment
under Article 34

1

CLAIMS

1. (currently amended) A nematic liquid crystal composition comprising at least one compound selected from the group of compounds represented by the general formulas (IA), (IA-1), (IA-3), (IB), (IB-1) and (IB-3), the total content being from 10 to 40% by mass, at least one compound selected from the group of compounds represented by the general formulas (IIA), (IIA-1), (IIA-3), (IIA-5), (IIB), (IIB-1), (IIB-3), (IIB-5), (IIC), (IIC-3), (IIC-7), (IIC-9), (IIC-10) and (IID), the total content being from 10 to 70% by mass, the content of the compound represented by the general formula (IIC), (IIC-3), (IIC-7), (IIC-9) and (IIC-10) being from 10 to 40% by mass, the total content of the compounds selected from the group of compounds represented by the general formulas (IA), (IA-1), (IA-3), (IB), (IB-1), (IB-3), (IIC), (IIC-3), (IIC-7), (IIC-9) and (IIC-10) being from 45 to 70% by mass, the total content of at least one compound selected from the group of compounds represented by the general formulas (IA), (IA-1), (IA-3), (IB), (IB-1), (IB-3), (IIA), (IIA-1), (IIA-3), (IIA-5), (IIB), (IIB-1), (IIB-3), (IIB-5), (IIC), (IIC-3), (IIC-7), (IIC-9), (IIC-10) and (IID) being from 35 to 80% by mass, and a compound represented by the general formula (III) in the content of 20 to 65% by mass, wherein a dielectric constant anisotropy is within a range from -12 to -3, a nematic phase-

isotropic liquid phase transition temperature (T_{N-I}) is within a range from 80 to 120°C, and a viscosity is 45 mPa·s or less:



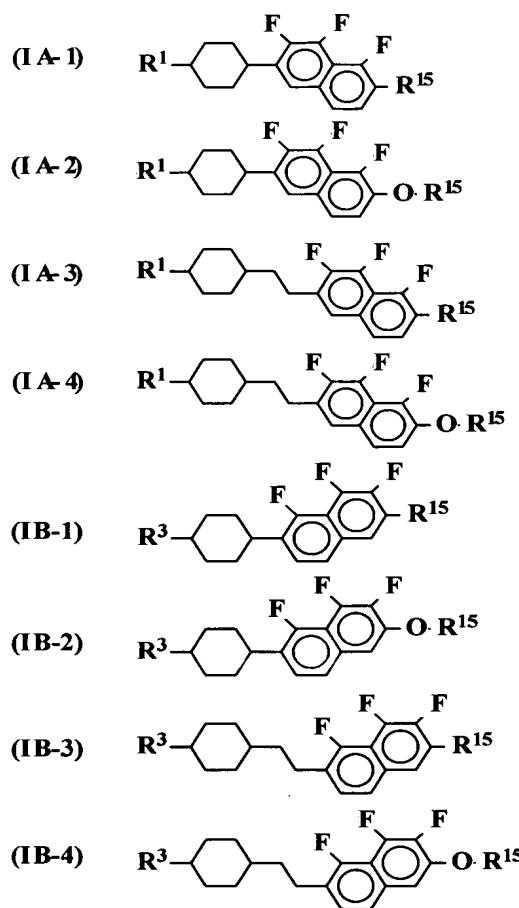
wherein R^1 , R^3 , R^5 , R^7 , R^9 , R^{11} , R^{12} , R^{13} and R^{14} each independently represents an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, or an alkenyloxy group having 2 to 10 carbon atoms, and one, or two or more CH_2 groups, which are present in said alkyl group, said alkoxy group, said alkenyl group or said alkenyloxy group, may be substituted with $-O-$, $-CO-$ or $-COO-$, while O atoms do not bond with each other directly;

R^2 , R^4 , R^6 , R^8 and R^{10} each independently represents an alkyl group having 1 to 10 carbon atoms, or an alkenyl group having 2 to 10 carbon atoms, and one, or two or more CH_2 groups,

which are present in said alkyl group, said alkoxy group, said alkenyl group or said alkenyloxy group, may be substituted with -O-, -CO- or -COO-, while O atoms do not bond with each other directly; and

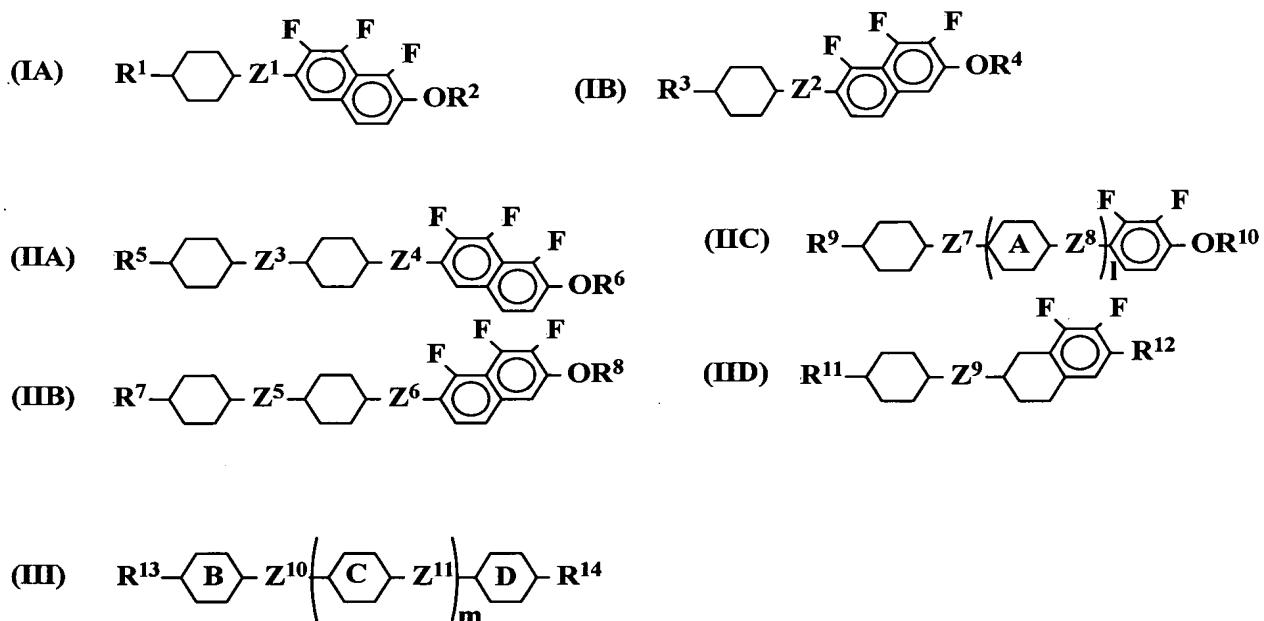
Z^1 to Z^6 and Z^9 to Z^{11} each independently represents a single bond, $-CH_2CH_2-$, $-CH=CH-$, $-CH_2CH_2CH_2CH_2-$, $-CH_2CH_2CH_2O-$, $-OCH_2CH_2CH_2-$, $-CH=CHCH_2CH_2-$, $-CH_2CH_2CH=CH-$, $-C\equiv C-$, $-CH_2O-$, $-OCH_2-$, $-CF_2O-$, $-COO-$, or $-OCO-$; Z^7 and Z^8 each independently represents a single bond, $-CH_2CH_2-$, $-CH=CH-$, $-CH_2CH_2CH_2CH_2-$, $-CH_2CH_2CH_2O-$, $-OCH_2CH_2CH_2-$, $-CH=CHCH_2CH_2-$, $-CH_2CH_2CH=CH-$, $-C\equiv C-$, $-CH_2O-$, or $-OCH_2-$; l and m represents 0 or 1; A represents a trans-1,4-cyclohexylene group or a 1,4-phenylene group; and B, C and D each independently represents a trans-1,4-cyclohexylene group, a 1,4-phenylene group, or a trans-1,4-cyclohexenylene group,

and



wherein R¹ and R³ represent an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, or an alkenyloxy group having 2 to 10 carbon atoms, and one or more CH₂ groups, which are present in said alkyl group, said alkoxy group, said alkenyl group or said alkenyloxy group, may be substituted with -O-, -CO- or -COO-, while O atoms do not bond with each other directly; and R¹⁵ represents an alkyl group having 1 to 10 carbon atoms or an alkenyl group having 2 to 10 carbon atoms.

2. (currently amended) A nematic liquid crystal composition comprising at least one compound selected from the group of compounds represented by the general formulas (IA), (IA-1), (IA-3), (IB), (IB-1) and (IB-3), the total content being from 25 to 60% by mass, at least one compound selected from the group of compounds represented by the general formulas (IIA), (IIA-1), (IIA-3), (IIA-5), (IIB), (IIB-1), (IIB-3), (IIB-5), (IIC), (IIC-3), (IIC-7), (IIC-9), (IIC-10) and (IID), the total content being from 10 to 70% by mass, the total content of the compounds selected from the general formulas (IA), (IA-1), (IA-3), (IB), (IB-1), (IB-3), (IIA), (IIA-1), (IIA-3), (IIA-5), (IIB), (IIB-1), (IIB-3) and (IIB-5), being from 35 to 65% by mass, the total content of at least one compound selected from the group of compounds represented by the general formulas (IA), (IA-1), (IA-3), (IB), (IB-1), (IB-3), (IIA), (IIA-1), (IIA-3), (IIA-5), (IIB), (IIB-1), (IIB-3), (IIB-5), (IIC), (IIC-3), (IIC-7), (IIC-9), (IIC-10) and (IID) being from 35 to 80% by mass, and a compound represented by the general formula (III) in the content of 35 to 65% by mass, wherein a dielectric constant anisotropy is within a range from -12 to -3, a nematic phase-isotropic liquid phase transition temperature (T_{N-I}) is within a range from 80 to 120, and a viscosity is 45 mPa·s or less:



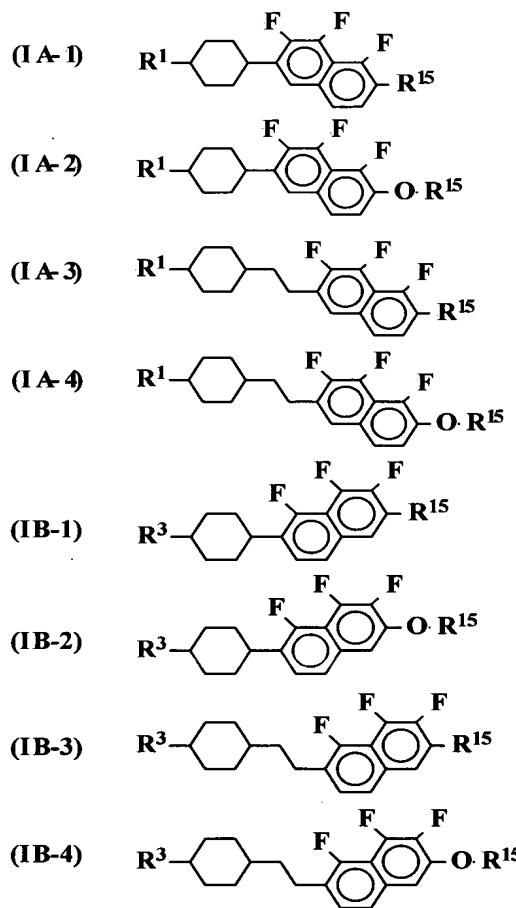
wherein R¹, R³, R⁵, R⁷, R⁹, R¹¹, R¹², R¹³ and R¹⁴ each independently represents an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, or an alkenyloxy group having 2 to 10 carbon atoms, and one, or two or more CH₂ groups, which are present in said alkyl group, said alkoxy group, said alkenyl group or said alkenyloxy group, may be substituted with -O-, -CO- or -COO-, while O atoms do not bond with each other directly;

R², R⁴, R⁶, R⁸ and R¹⁰ each independently represents an alkyl group having 1 to 10 carbon atoms, or an alkenyl group having 2 to 10 carbon atoms, and one, or two or more CH₂ groups, which are present in said alkyl group, said alkoxy group, said alkenyl group or said alkenyloxy group, may be substituted with -O-, -CO- or -COO-, while O atoms do not

bond with each other directly; and

Z^1 to Z^6 and Z^9 to Z^{11} each independently represents a single bond, $-\text{CH}_2\text{CH}_2-$, $-\text{CH}=\text{CH}-$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2-$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{O}-$, $-$
 $\text{OCH}_2\text{CH}_2\text{CH}_2-$, $-\text{CH}=\text{CHCH}_2\text{CH}_2-$, $-\text{CH}_2\text{CH}_2\text{CH}=\text{CH}-$, $-\text{C}\equiv\text{C}-$, $-\text{CH}_2\text{O}-$, $-\text{OCH}_2-$,
 $-\text{CF}_2\text{O}-$, $-\text{COO}-$, or $-\text{OCO}-$; Z^7 and Z^8 each independently represents a single bond, $-\text{CH}_2\text{CH}_2-$, $-\text{CH}=\text{CH}-$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2-$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{O}-$, $-\text{OCH}_2\text{CH}_2\text{CH}_2-$, $-\text{CH}=\text{CHCH}_2\text{CH}_2-$, $-\text{CH}_2\text{CH}_2\text{CH}=\text{CH}-$, $-\text{C}\equiv\text{C}-$,
 $-\text{CH}_2\text{O}-$, or $-\text{OCH}_2-$; l and m represent 0 or 1; A represents a trans-1,4-cyclohexylene group or a 1,4-phenylene group; and B , C and D each independently represents a trans-1,4-cyclohexylene group, a 1,4-phenylene group, or a trans-1,4-cyclohexenylene group,

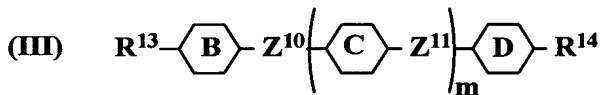
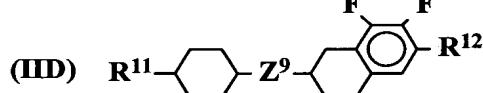
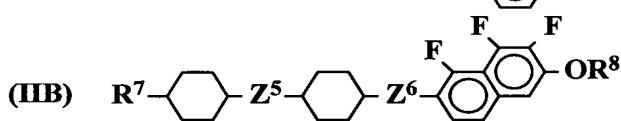
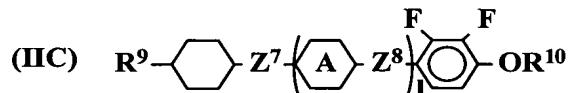
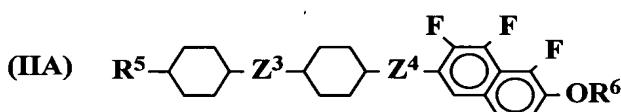
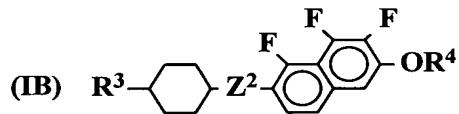
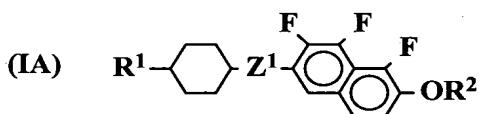
and



wherein R¹ and R³ represent an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, or an alkenyloxy group having 2 to 10 carbon atoms, and one or more CH₂ groups, which are present in said alkyl group, said alkoxy group, said alkenyl group or said alkenyloxy group, may be substituted with -O-, -CO- or -COO-, while O atoms do not bond with each other directly; and R¹⁵ represents an alkyl group having 1 to 10 carbon atoms or an alkenyl group having 2 to 10 carbon atoms.

3. (currently amended) A nematic liquid crystal composition comprising at least one compound selected from the group of compounds represented by the general formulas (IA), (IA-1), (IA-3), (IB), (IB-1) and (IB-3), the total content being from 20 to 70% by mass, at least one compound selected from the group of compounds represented by the general formulas (IIA), (IIA-1), (IIA-3), (IIA-5), (IIB), (IIB-1), (IIB-3), (IIB-5), (IIC), (IIC-3), (IIC-7), (IIC-9), (IIC-10) and (IID), the total content being from 10 to 70% by mass, the total content of the compounds selected from the group of compounds selected from the general formulas (IA), (IA-1), (IA-3), (IB), (IB-1), (IB-3), (IIA), (IIA-1), (IIA-3), (IIA-5), (IIB), (IIB-1), (IIB-3) and (IIB-5), being from 20 to 60% by mass, the total content of the compounds selected from the group of compounds represented by the general formulas (IIC), (IIC-3), (IIC-7), (IIC-9), (IIC-10) and (IID) being from 30 to 60% by mass, the total content of the compounds selected from the group of compounds represented by the general formulas (IA), (IA-1), (IA-3), (IB), (IB-1), (IB-3), (IIA), (IIA-1), (IIA-3), (IIA-5), (IIB), (IIB-1), (IIB-3), (IIB-5), (IIC), (IIC-3), (IIC-7), (IIC-9), (IIC-10) and (IID) being from 70 to 80% by mass, and a compound represented by the general formula (III) in the content of 20 to 65% by mass, wherein a dielectric constant anisotropy is within a range from -12 to -3, a nematic phase-isotropic liquid phase transition temperature

(T_{N-I}) is within a range from 80 to 120°C, and a viscosity is 45 mPa·s or less:



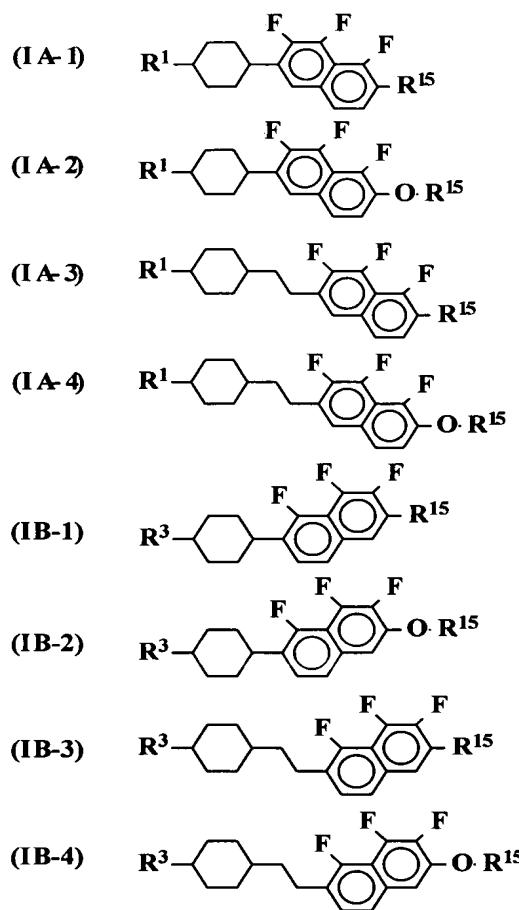
wherein R¹, R³, R⁵, R⁷, R⁹, R¹¹, R¹², R¹³ and R¹⁴ each independently represents an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, or an alkenyloxy group having 2 to 10 carbon atoms, and one, or two or more CH₂ groups, which are present in said alkyl group, said alkoxy group, said alkenyl group or said alkenyloxy group, may be substituted with -O-, -CO- or -COO-, while O atoms do not bond with each other directly;

R², R⁴, R⁶, R⁸ and R¹⁰ each independently represents an alkyl group having 1 to 10 carbon atoms, or an alkenyl group having 2 to 10 carbon atoms, and one, or two or more CH₂ groups,

which are present in said alkyl group, said alkoxy group, said alkenyl group or said alkenyloxy group, may be substituted with -O-, -CO- or -COO-, while O atoms do not bond with each other directly; and

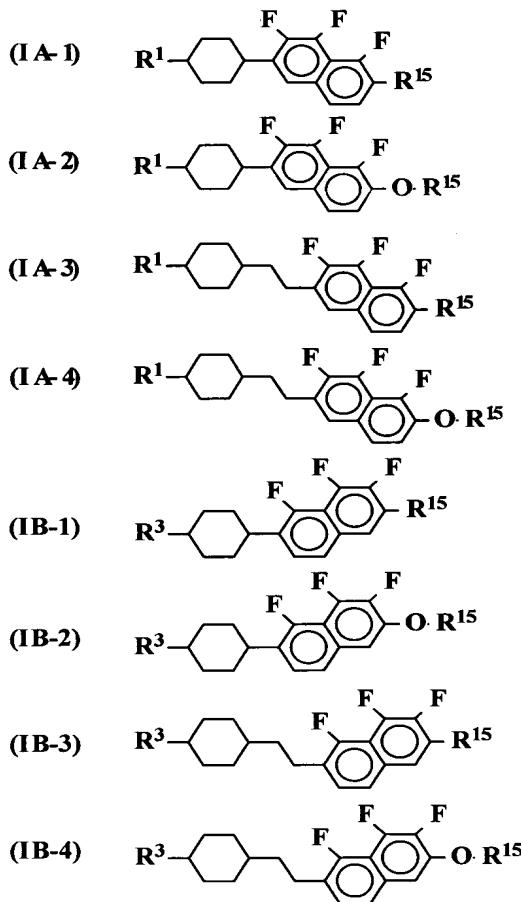
Z^1 to Z^6 and Z^9 to Z^{11} each independently represents a single bond, $-CH_2CH_2-$, $-CH=CH-$, $-CH_2CH_2CH_2CH_2-$, $-CH_2CH_2CH_2O-$, $-OCH_2CH_2CH_2-$, $-CH=CHCH_2CH_2-$, $-CH_2CH_2CH=CH-$, $-C\equiv C-$, $-CH_2O-$, $-OCH_2-$, $-CF_2O-$, $-COO-$, or $-OCO-$; Z^7 and Z^8 each independently represents a single bond, $-CH_2CH_2-$, $-CH=CH-$, $-CH_2CH_2CH_2CH_2-$, $-CH_2CH_2CH_2O-$, $-OCH_2CH_2CH_2-$, $-CH=CHCH_2CH_2-$, $-CH_2CH_2CH=CH-$, $-C\equiv C-$, $-CH_2O-$, or $-OCH_2-$; l and m represent 0 or 1; A represents a trans-1,4-cyclohexylene group or a 1,4-phenylene group; and B, C and D each independently represents a trans-1,4-cyclohexylene group, a 1,4-phenylene group, or a trans-1,4-cyclohexenylene group,

and



wherein R¹ and R³ represent an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, or an alkenyloxy group having 2 to 10 carbon atoms, and one or more CH₂ groups, which are present in said alkyl group, said alkoxy group, said alkenyl group or said alkenyloxy group, may be substituted with -O-, -CO- or -COO-, while O atoms do not bond with each other directly; and R¹⁵ represents an alkyl group having 1 to 10 carbon atoms or an alkenyl group having 2 to 10 carbon atoms.

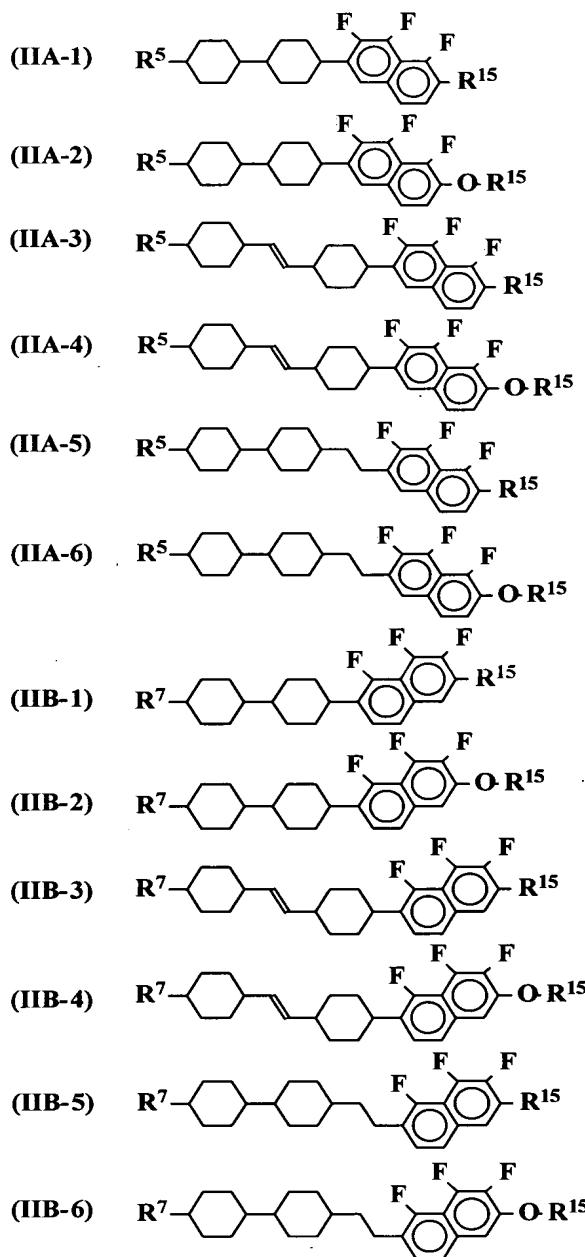
4. (currently amended) The nematic liquid crystal composition according to claim 1, 2 or 3, wherein the compound represented by the general formula (IA) comprises compounds represented by the general formulas (IA-2) or (IA-4), and the compound represented by the general formula (IB) comprises compounds represented by the general formulas (IB-2) or (IB-4) :



wherein R¹ and R³ represent an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, or an alkenyloxy

group having 2 to 10 carbon atoms, and one or more CH₂ groups, which are present in said alkyl group, said alkoxy group, said alkenyl group or said alkenyloxy group, may be substituted with -O-, -CO- or -COO-, while O atoms do not bond with each other directly; and R¹⁵ represents an alkyl group having 1 to 10 carbon atoms or an alkenyl group having 2 to 10 carbon atoms.

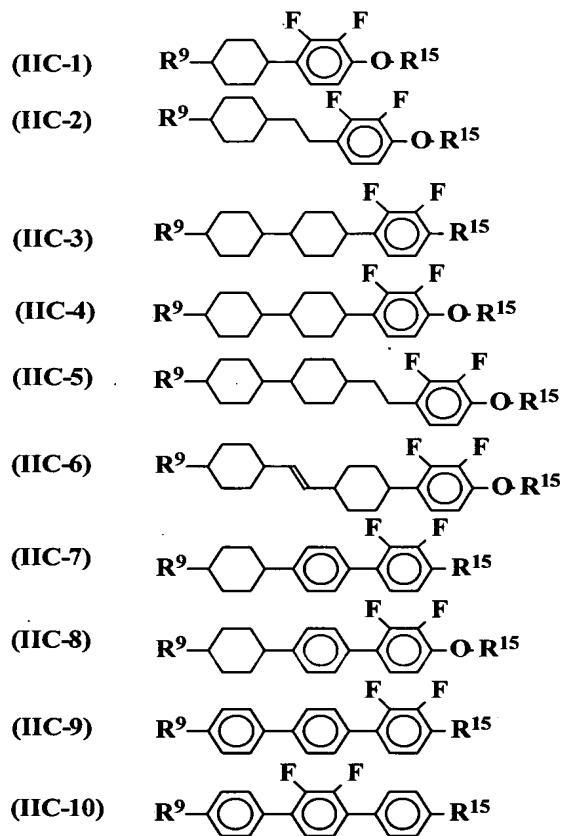
5. (currently amended) The nematic liquid crystal composition according to claim 1, 2 or 3, wherein the compound represented by the general formula (IIA) comprises compounds represented by the general formulas (IIA-2), (IIA-4) or (IIA-6), and the compound represented by the general formula (IIB) comprises compounds represented by the general formulas (IIB-2), (IIB-4) or (IIB-6):



wherein R⁵ and R⁷ represent an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, or an alkenyloxy group having 2 to 10 carbon atoms, one or more CH₂ groups, which are present in said alkyl group, said alkoxy group,

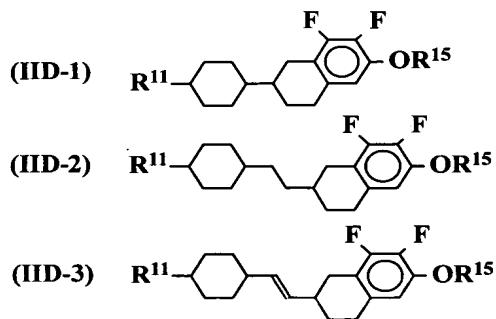
said alkenyl group or said alkenyloxy group, may be substituted with -O-, -CO- or -COO-, while O atoms do not bond with each other directly, and each substituent preferably represents an alkyl group having 1 to 5 carbon atoms or an alkenyl group having 2 to 5 carbon atoms, and the alkenyl group is particularly preferably a vinyl group, 1-propenyl group, or a 3-butenyl group, and R¹⁵ represents an alkyl group having 1 to 10 carbon atoms or an alkenyl group having 2 to 10 carbon atoms.

6. (currently amended) The nematic liquid crystal composition according to claim 1, 2 or 3, wherein the compound represented by the general formula (IIC) comprises compounds represented by the general formulas (IIC-1), (IIC-2), (IIC-4), (IIC-5), (IIC-6) or (IIC-8):



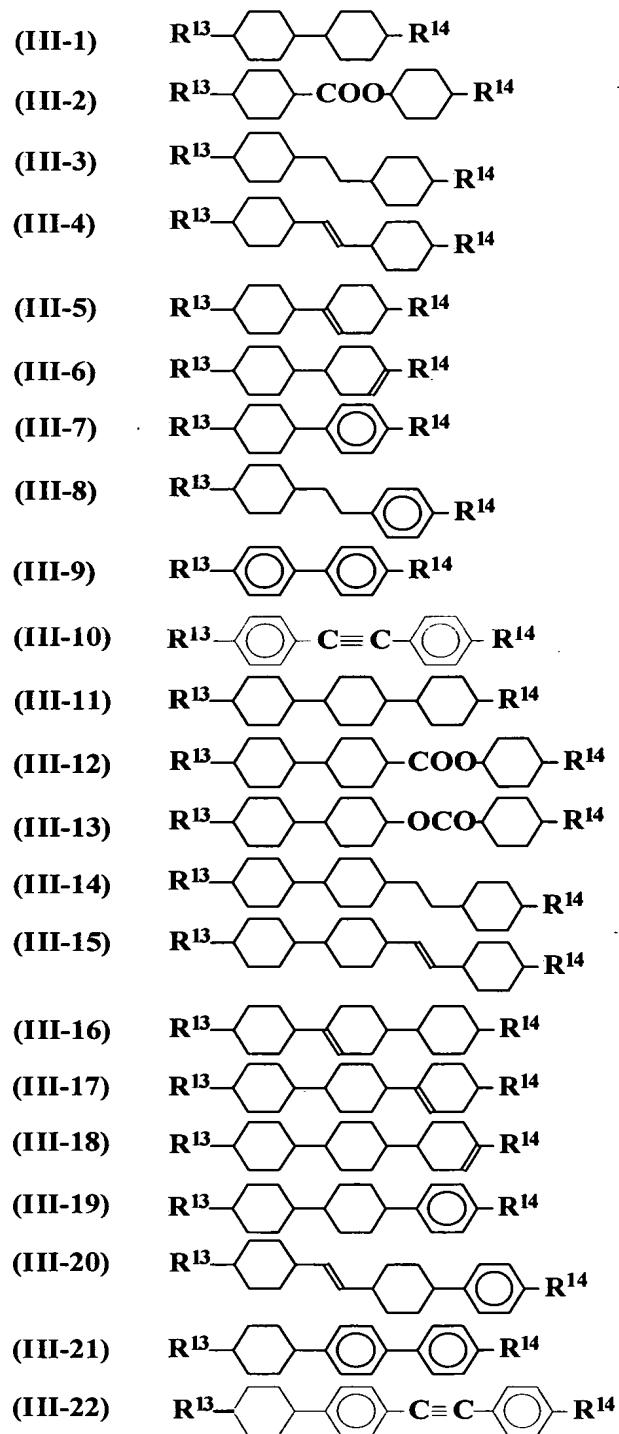
wherein R^9 represents an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, or an alkenyloxy group having 2 to 10 carbon atoms, and one or more CH_2 groups, which are represent in said alkyl group, said alkoxy group, said alkenyl group or said alkenyloxy group, may be substituted with $-O-$, $-CO-$, or $-COO-$, while O atoms do not bond with each other directly, and R^{15} represents an alkyl group having 1 to 10 carbon atoms or an alkenyl group having 2 to 10 carbon atoms.

7. (previously amended) The nematic liquid crystal composition according to claim 1, 2 or 3, wherein the compound represented by the general formula (IID) comprises compounds represented by the general formulas (IID-1) to (IID-3) :



wherein R¹¹ represents an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, or an alkenyloxy group having 2 to 10 carbon atoms, one or more CH₂ groups, which are present in said alkyl group, said alkoxy group, said alkenyl group or said alkenyloxy group, may be substituted with -O-, -CO- or -COO-, while O atoms do not bond with each other directly, the substituent preferably represents an alkyl group having 1 to 5 carbon atoms, or an alkenyl group having 2 to 5 carbon atoms, and the alkenyl group is particularly preferably a vinyl group, a 1-propenyl group, or a 3-butenyl group, and R¹⁵ represents an alkyl group having 1 to 10 carbon atoms or an alkenyl group having 2 to 10 carbon atoms.

8. (previously amended) The nematic liquid crystal composition according to claim 1, 2 or 3, wherein the compound represented by the general formula (III) comprises compounds represented by the general formulas (III-1) to (III-22) :



wherein R¹³ and R¹⁴ represent an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, an

alkenyl group having 2 to 10 carbon atom, or an alkenyloxy group having 2 to 10 carbon atoms, one or more CH₂ groups, which are present in said alkyl group, said alkoxy group, said alkenyl group or said alkenyloxy group, may be substituted with -O-, -CO- or -COO-, while O atoms do not bond with each other directly, each substituent independently represents an alkyl group having 1 to 5 carbon atoms or an alkenyl group having 2 to 5 carbon atoms, preferably, and the alkenyl group is particularly preferably a vinyl group, a 1-propenyl group, or a 3-butenyl group.

9. (Canceled)

10. (previously amended) The nematic liquid crystal composition according to any one of claims 4 to 8, wherein the dielectric constant anisotropy is within a range from -6 to -3,

the nematic phase-isotropic liquid phase transition temperature (T_{N-I}) is within a range from 80 to 120°C,

the refractive index anisotropy is within a range from 0.07 to 0.15, and

the viscosity is 30 mPa·s or less.

11. (previously amended) The nematic liquid crystal composition according to any one of claims 4 to 8, wherein

the dielectric constant anisotropy is within a range from -6 to -3,

the nematic phase-isotropic liquid phase transition temperature (T_{N-I}) is within a range from 80 to 120°C,

the refractive index anisotropy is within a range from 0.07 to 0.15, and

the viscosity is 30 mPa·s or less.

12. (previously amended) The nematic liquid crystal composition according to any one of claims 4 to 8, wherein the dielectric constant anisotropy is within a range from -12 to -6,

the nematic phase-isotropic liquid phase transition temperature (T_{N-I}) is within a range from 80 to 120°C,

the refractive index anisotropy is within a range from 0.07 to 0.15, and

the viscosity is 45 mPa·s or less.

13. A liquid crystal display device for active matrix display, using the nematic liquid crystal composition according to any one of claims 1 to 12.

14. A liquid crystal display device for VA mode, IPS mode or ECB mode, using the nematic liquid crystal composition according to any one of claims 1 to 12.